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Case Report

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Cardiopulmonary resuscitation in lateral decubitus position

Abstract

A patient developed asystole while undergoing craniotomy in lateral position. As the patient's head was fixed in a Maryfield head-support for surgery, waiting for resoration of supine position, to initiate resuscitation, would have resulted in loss of precious time. Cardiopulmonary resuscitation was initiated in lateral position using both fists to compress the sternum. Adequate arterial pressures were generated by the manuvere. After restoration of supine position, defibrillation was done and effective cardiac rhythm was reestablished. The outcome was successful with no neurological sequelae.

Keywords: cardiopulmonary resuscitation, lateral decubitus, neurosurgery

Volume 3 Issue 4 - 2015

Asma Murtaza Khan, Mukul Chandra Kapoor, Bitu Prasad Deuri
Department of Anesthesiology, Saket City Hospital, India

Correspondence: Mukul Chandra Kapoor, Department of Anesthesiology, Saket City Hospital, 6 Dayanand Vihar, Delhi, India, Tel +91-9971888773, Fax +91-11-26963801, Email mukulanjali@gmail.com

Received: October 30, 2015 | **Published:** November 13, 2015

Abbreviations: CPR, cardiopulmonary resuscitation; LBBB, left bundle branch block; ECG, electrocardiogram; IV, intravenous; AHA, american heart association

Introduction

Early initiation of Cardiopulmonary resuscitation (CPR) results in more favorable outcome. CPR is most effective in supine position. There are no recommendations about initiation of CPR in case of cardiac arrest happens during surgery, in a position other than supine. We describe the successful resuscitation, after initiation of CPR in lateral position, in a patient who developed asystole while undergoing craniotomy. The patient reviewed the Case Report and has given written permission to publish the report.

Case presentation

A 35-year-old woman, with a recurrent right acoustic neuroma, presented with complaints of severe headache, dizziness, facial deviation, syncopal attacks and right-sided ptosis following previous surgery. Pre-anesthetic evaluation was unremarkable except for evidence of left bundle branch block (LBBB) in the electrocardiogram (ECG). Patient was scheduled for elective retromastoid craniotomy and tumor excision. Anesthesia was induced in a routine manner and airway secured. Routine monitoring was initiated. Right subclavian vein and radial artery were cannulated. Patient was placed in left lateral decubitus position and the head placed in a Maryfield head-support for surgery. Five hours after initiation of surgery and complete removal of the tumor, while verifying hemostasis around the fifth cranial nerve, the patient developed ventricular tachycardia, which reverted to sinus rhythm on removal of the stimulus and lignocaine administration intravenous (IV). Later, during the course of the surgery, patient developed severe bradycardia, which did not respond to IV atropine and progressed to asystole. To avoid delaying initiation of CPR and prevent hypoxic cerebral damage, CPR was initiated in lateral position itself. The scrub nurse was asked to stabilize and push spine forward. As it was difficult to place the palms flat on chest wall under the pile of drapes, chest compressions were administered by the anesthesiologist by pushing the lower third of the sternum with both fists, with the elbows locked in extension and using the body weight to facilitate the push. A systolic pressure of about 70 mm Hg (as seen on IBP tracing) was generated by this maneuver. Adrenaline was administered IV and the rhythm changed to ventricular fibrillation. CPR was continued in lateral position till cranium was packed and the head-support removed. The patient placed in supine position with minimal interruptions. As soon as the patient was placed in supine position, three defibrillation shocks were administered and CPR was continued as per American Heart Association (AHA) guidelines. After a total period of 10 minutes CPR, normal cardiac rhythm was restored. The surgical procedure was near complete and so surgical closure was done. Patient was administered a bolus dose of amiodarone 300mg intravenous and thereafter its intravenous infusion was started as the patient continued to have ectopic beats. The patient was transferred to intensive care unit for elective ventilation. Elective ventilation was weaned off the following morning. Patient elicited no new neurological deficit. Immediate post-resuscitation arterial blood gas (pH 7.35/ pCO2 45/ pO2 201; FiO2 1.0) did not display signs of metabolic acidosis and the postoperative ECG did not display any change. Echocardiography and coronary angiography done, two days postoperative, were essentially normal. On complete recovery, patient was discharged home on the 20th postoperative day.

Discussion

Sitting, lateral and prone positions are frequently used to access intracranial lesions in different parts of the brain. Asystole due to neurological cause is rare but a known complication during neurosurgery. Trigemino-cardiac reflex, pressure on brainstem, and vago-glossopharyngeal reflex are potent reflexes that can induce bradycardia or asystole during surgery.[1-3] Other causes such as cardiac pathology, hypoxia, light plane of anesthesia and anesthetic drugs have also been attributed to lead to intraoperative bradycardia or asystole.[4]

Our patient had LBBB but had no evidence of heart disease preoperatively. LBBB is usually associated with previous heart disease, but in up to 12% of cases, it may be just an isolated LBBB.[5] LBBB is associated with higher than normal risk for cardiovascular events.[6] The appearance and disappearance of bradycardia was related to surgical stimulation. Although our patient had associated LBBB, the on-table brady-arrhythmias were possibly not related to a cardiac event as the echocardiogram and coronary angiogram, done postoperatively, were normal. There are only two reports of successful CPR in right lateral position. Bengali, et al.[7] have described CPR in

lateral position, during renal surgery, with the palm of dominant hand over patient's mid-thoracic spine and other hand directly opposite against the sternum to compress the chest between the two palms.[7] Abraham et al have described cardiac compressions using two thumb-encircling hand technique in a 6-year-old child for intracranial surgery.[8] In our case, the scrub nurse was asked to stabilize the spine while the anesthesiologist pushed the lower third of the sternum with both fists, with the elbows locked in extension and using the body weight to push. Chest compressions delivered by the lateral push generated adequate blood pressure. There was no clinical or laboratory evidence of tissue ischemia or infarction, implying that adequate tissue perfusion and oxygenation were achieved during resuscitation performed in the lateral position.

There are limited reports on successful CPR in prone position with anesthesiologists improvising to perform CPR or even give electric therapy.[9-11] Some attempts were successful while others futile. Cardiac compressions were achieved by pushing the spine downwards so as to compress the heart between the sternum and the spine.

Although the 2005 AHA guidelines for CPR and cardioversion did support performing maneuver in prone position in hospitalized patients with secured airway, no guidelines have been formulated for CPR in odd positions. Since there are no guidelines on CPR in odd positions, attempts are made to make patient supine before initiating CPR, thereby increasing "NO circulation" time, worsening patient outcomes and potentially making the surgical site inaccessible to achieve asepsis and hemostasis. If cardiac arrest occurs in a position other than supine, waiting for patient to be undraped and placed supine, may lead to loss of critical time for CPR.

There are only a few reports describing successful CPR in prone and lateral position. No data is available in contemporary literature, on the part of the chest wall to be compressed or on the placement of cardioversion pads, while providing CPR in odd positions. Even if the rescuer cannot to be positioned appropriately for delivery of chest compressions, one must not wait but rather attempt chest compressions to maintain circulation, even if minimal, to prevent hypoxic brain damage and improve patient outcome.

Conflicts of Interest

The authors do not have any Conflict of interests.

Acknowledgments

None.

Funding

None.

References

1. Usami K, Kamada K, Kunii N, et al. Transient asystole during surgery for posterior fossa meningioma caused by activation of the trigeminocardiac reflex: Three case reports. *Neurol Med Chir*. 2010;50(4):339–342.
2. Kawasaki S, Ishii M, Kon S, et al. A case of sporadic and transient bradyarrhythmias in a patient with a glioma in the medulla oblongata. *Kokyu To Junkan*. 1993;41(8):787–790.
3. Elias J, Kuniyoshi R, Valadao W, et al. Glossopharyngeal neuralgia associated with cardiac syncope. *Arq Bra Cardiol.* 2002;78(5):515–519.
4. Kinsella SM, Tuckey JP. Perioperative bradycardia and asystole: Relationship to vasovagal syncope and the Bezold Jarisch reflex. *Br J Anaesth.* 2001;86(6):859–868.
5. Jain AC, Mehta MC. Etiologies of left bundle branch block and correlation to hemodynamic and angiographic findings. *Am Heart J.* 2003;91(11):1375–1378.
6. Miller WL, Ballman KV, Hodge DO, et al. Risk factor implications of incidentally discovered uncomplicated left bundle branch block. *Mayo Clin Proc.* 2005;80(12):1585–1590.
7. Bengali R, Janik LS, Kurtz M, et al. Successful cardiopulmonary resuscitation in the lateral position during intraoperative cardiac arrest. *Anesthesiology.* 2014;120(4):1046–1049.
8. Abraham M, Wadhawan M, Gupta V, et al. Cardiopulmonary Resuscitation in the lateral position: Is it feasible during pediatric intracranial surgery? *Anesthesiology.* 2009;110(5):1185–1186.
9. Gomes D, Bersot CD. Cardiopulmonary Resuscitation in the Prone Position. *O J Anes.* 2012;2(5):199–201.
10. Takei T, Nakazawa K, Ishikawa S, et al. Cardiac arrest in the left lateral decubitus position and extracorporeal cardiopulmonary resuscitation during neurosurgery: a case report. *J Anesth*. 2010;24(3):447–451.
11. Miranda CC, Newton DC. Successful Defibrillation in the Prone Position. *Br J Anaesth*. 2000;87(6):937–938.